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The relationship between social cognition and functional outcomes in schizophrenia

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Abstract

Social cognition, an area of interest in schizophrenia research, has been related to functional outcomes. In this paper, we intended to determine if social cognition is impaired in individuals with schizophrenia (N=15), compared to controls (N=15) and to investigate the correlation between social cognition (measured with Narrative of Emotions Task), neurocognition (Montreal Cognitive Assessment) and functional outcomes (Role Functioning Scale, Independent Living Skills Survey). Our results suggest that higher levels of social cognition are related to better functioning in schizophrenia and that social cognition might have a specific influence, irrespective of the common processes it shares with neurocognition.

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Keywords: social cognition ; schizophrenia ; neurocognition ; functional outcomes.

1. Introduction

Social cognition, usually defined as the ability to construct representations about oneself, others and interpersonal relationships (Sergi et al., 2006), is an area of great interest in the field of schizophrenia. Deficits in this capacity were confirmed using a wide variety of tasks (Green et al., 2005). An important direction in the investigation of social cognition in schizophrenia is its influence on the level of functioning. Impairments of this ability seem to be key determinants in some major areas of functioning. Researchers in the field are also interested in identifying the neural correlates of this construct (Green et al., 2005). In this regard, there are disputes in the literature about the relationship between social cognition and neurocognition. The question is to what extent social cognition, which is based on neurocognitive processes, has a specific influence.

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The impact of such impairments is very important because it affects not only the ability to relate to other people, but also the capacity of self-reflection, as these persons often have difficulties with being aware and understanding their own needs and, further, with establishing life purposes consistent with their needs (Dimaggio et al., 2008).

Based on these observations, we decided to investigate possible deficits in social cognition, in people with schizophrenia. We assumed it would be a significant impairment when compared to a non-clinical sample. We were also interested in the impact of such deficits on the general functioning of individuals with this diagnosis. In this regard, we expected it to be negative and more important than the impact of non-social cognition deficits. These constructs, social and non-social cognition, although share a common base and are partially correlated (cf. Couture, Penn & Roberts, 2006, Bell et al., 2009, Hoe et al., 2012), are yet distinct, and their influence could manifest in a different way (Fett et al., 2011). Thus, we sought to capture the relationship between the two types of cognition and functioning, assuming that social cognition would have a higher correlation with outcomes.

2. Method

2.1. Participants

We tested our hypotheses on a sample of 15 individuals diagnosed with schizophrenia (9 females, 6 males), aged between 26 and 55 years (mean age = 41.93, SD = 8.39), hospitalized in the Psychiatric Hospital "Constantin Gorgos". In order to have a more rigorous control of covariance sources, we established some exclusion criteria. In this regard, the most important criterion was the stability over time of the diagnosis. To make sure of this, we only included in the sample individuals whose diagnosis was older than three years. We also established that patients whose score at the cognitive skills task is less than 10 should be excluded, since this score may indicate severe dementia (Nasreddine et al., 2005). All patients were under psychiatric treatment at the time. We mention that the control sample was designed to match the clinical one in distribution by gender, age and level of education.

2.2. Instruments

2.2.1. Social cognition

Social cognition was measured using the Narrative of Emotions Task (NET; Buck, 2013). NET is a semi-structured interview in which subjects are asked to define an emotion, to report a situation when they felt it and to explain why that specific event has aroused that emotion. The three questions are repeated for eight emotions: four simple emotions (scared, happy, sad and angry), two complex emotions (surprised and suspicious) and two self-conscious emotions (guilty and ashamed). Thus, there is a distinction between emotions involving simple cognitive assessments of a situation and those that require a complex analysis of socio-cultural norms, expectations and intentions of other people. In the same time, these are common emotions that may be experienced by any individual. NET consists of three social cognition indices (emotion perception index, theory of mind index and attribution style index). The author (Buck, 2013) reported good psychometric properties. The instrument was able to differentiate between individuals with schizophrenia and controls and also had reliable evidence of convergent, divergent and ecological validity. The Romanian version of the questionnaire showed a strong reliability (Cronbach Alfa = 0.973). The internal consistency of indices varied between 0.79 and 0.914.

2.2.2. Neurocognition

In the assessment of neurocognition we used the Montreal Cognitive Assessment (MoCA), created by Nasreddine in 1996 and validated by Nasreddine and colleagues in 2005. It is a quick screening tool for mild cognitive impairment. It assesses the following domains: attention and concentration, executive functions, memory, language, conceptual thinking, calculations and orientation. The advisability of this task as a screening instrument of cognition in schizophrenia was tested by Fisekovic, Memic & Pasalic (2012) and Preda et al. (2011). The mean MoCA score on a sample of 30 patients diagnosed with schizophrenia was 20+/- 4.7. MoCA scores did not significantly correlate with measures of positive and negative symptoms, suggesting that cognitive deficits in schizophrenia might be distinct symptoms. Preda et al. (2011) concluded that MoCA is a useful screening tool in the assessment of cognitive deficits associated with schizophrenia, also having the advantage of a quick and easy administration.

2.2.3. Functional outcomes

Two measures of functional outcomes were used: the Role Functioning Scale (RFS; Goodman et al., 1993) and The Independent Living Skills Survey (ILSS, developed by Wallace et al., 2000), whose scores were summed up in order to assure a comprehensive assessment of functioning in different areas.

The RFS measures the following areas: work productivity, self care, immediate social network and extended social network. Ratings are made on seven point scales linked to behavioral descriptors. This instrument has good psychometric properties, in terms of reliability and validity. Test-retest reliability varies between 0.85–0.92 and the inter-rater reliability is between 0.64–0.82. Construct validity was proved by the fact that the instrument successfully discriminated between psychiatric patients and controls. The results on these scales were significantly correlated with measures of mental disturbance and with observations of every day functioning, showing that the instrument has both convergent and ecological validity (Goodman et al., 1993). The internal consistency for the Romanian version is strong (Cronbach Alfa = 0.945). Kee et al. (2003) reported many studies in which RFS was used to assess functioning of individuals with schizophrenia, certifying the feasibility of this instrument for this purpose.

The ILSS is intended to evaluate basic skills of daily living in individuals with psychiatric diagnoses. In our research, we used the self-report version of the instrument. It has 70 items, grouped into 10 subscales: appearance, hygiene, care of personal belongings, preparation of food, health care, money management, traveling, leisure and community life, seeking for a job and maintaining a job. Response options are Yes, No and "Not apply". This instrument has also good psychometric properties. Test-retest reliability was 0.785 and convergent validity was confirmed by significant correlations with other tests that measure the same construct. The questionnaire was the best predictor of the employment status and also proved to be sensitive to effects of interventions and treatments (Wallace et al., 2000). For the Romanian version, internal consistency coefficient is 0.913, varying between 0.69 and 0.93 on the subscales.

2.3. Procedure

All participants were informed about the privacy of their answers and that they could retire at any time from the study without any further consequences. Participants in the clinical sample were tested individually. They were told that they would have to answer a series of questions about their daily life activities and their relationships with other people and to reflect on some personal experiences related to certain emotional states. They were also asked to solve a few tasks that required their attention and concentration. No participant from the clinical sample expressed distrust or suspiciousness. Patients received additional explanations and examples when needed.

3. Results

Descriptive statistics (means and SDs) from the measures of social cognition, neurocognition and functional outcomes are showed in table 1.

Table 1. Means and SDs from the measures of social cognition, neurocognition and functional outcomes.

	Mean	SD
Social cognition (control sample)	157.58	8.53
Social cognition (clinical sample)	90.53	19.48
Functional outcomes	22.41	3
Neurocognition	19.2	5.37

In order to determine if there is a significant difference between the two samples concerning the level of social cognition, we used the Mann-Whitney test. It revealed that the clinical sample had a significantly lower mean, indicating that social cognition is indeed impaired in individuals with schizophrenia (Mann-Whitney U test value = -5.28, $p < 0.001$, two-tailed).

Table 2. Results of Mann-Whitney (U) test – comparison of social cognition mean scores between the two samples

	Social cognition score
Z	-5.28
p	.000

Our data also indicate that there is a positive correlation between social cognition score and functional outcome score (Kendall tau coefficient = 0.5, p = 0.001), suggesting that higher levels of social cognition correspond to better functioning for individuals with schizophrenia. In the same time, we did not find any significant association between neurocognition and functional outcomes (Kendall tau = 0.28, p = 0.16).

Table 3. Correlations between social cognition, functional outcomes and neurocognition – Kendall tau coefficients and p values.

		Social cognition (clinical sample)	Functional outcomes	Neurocognition
Social cognition (clinical sample)	Kendall tau	–	0.5	–
	p	–	0.001	–
Functional outcomes	Kendall tau	0.5	–	0.28
	p	0.001	–	0.16
Neurocognition	Kendall tau	–	0.28	–
	p	–	0.16	–

4. Discussion

These results show a clearer picture of the role that social cognition plays in schizophrenia. We demonstrated that this ability, which is impaired in individuals with the disorder, has an important association with the level of functioning. Moreover, our data indicate that social cognition seems, in fact, to have a specific influence on functioning, irrespective of the common processes it shares with neurocognition, since the latter did not prove to be significantly correlated with functional outcomes. As a response to the disputes in the literature, we argue that social cognition is a distinct cognitive ability that has a specific influence in such a disorder. The ability to quickly process social stimuli is essential for any type of activity, starting with minimal social interaction and continuing with acquisition of independent living skills and integration in the community.

Our results are consistent with other findings in the field. Many studies reported deficits of social cognition in schizophrenia (e.g. Penn, Sanna & Roberts, 2008; Bell et al., 2009; Savla et al., 2012 etc). There are also multiple references concerning the relationship between these deficits and functional status. Fiszdon et al. (2013) note that about 24 of the studies they analyzed in a review, reported positive correlations between the two concepts. Bell et al. (2009) suggest that we may consider social cognition a distinct cognitive domain and according to Couture, Penn & Roberts (2006), neurocognition and social cognition are moderately correlated and they are based on semi-independent neural systems.

We emphasize that, in our research, we completed an extended assessment of both social cognition and functional outcomes. Most of the studies focus on only one component of social cognition and on one single domain of functioning. We managed to overcome such shortcomings as we assessed functioning on four major areas and we used a comprehensive measure of social cognition.

5. Conclusions

The results of the present work have both theoretical and clinical implications. Firstly, they contribute to the development of a more consistent psychological model concerning the studied variables. We showed that social cognition is indeed impaired in people with schizophrenia and that this ability correlates with the level of functioning. Although the two types of cognition are significantly correlated, they prove to be distinct concepts.

Our findings can be very helpful in developing psychological interventions in this field. Some authors, such as Frith and Frith (cited in Mazza et al., 2010) believe that social cognition has a normal development before onset of the disorder and that the deficits install and amplify over time. Therefore, early intervention at this level can have a

positive impact on the evolution of the disorder, because preventing the alteration of this important capacity may influence the individual's functioning. Although the impairment of functioning, which can be observed right from the onset, is not due only to this ability, we have reasons to believe that, since we found a significant relationship between the two, any therapeutic approach targeting improvements of social cognition will have a good impact on everyday functioning. Eack (2012) describes a detailed program for cognitive rehabilitation, aiming improvements of functional status, with very good results. A similar program can be adapted for specific intervention on social cognition processes.

In spite of these contributions, some limitations should be taken into consideration. First of all, the main limit is the small sample size that does not allow generalization of the results. Although hypotheses were tested with statistical procedures adapted to small samples, their interpretation must be made with caution. Another potential limit is the assessment of neurocognition that was succinct. We recommend, therefore, the replication of this study on larger samples, using a more comprehensive instrument for the assessment of cognition.

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